

Indiana State Department of Health

Extract of Analytical X-ray Regulations

This extract has been prepared to provide analytical x-ray facilities with the sections of 410 IAC 5 most pertinent to their operations. This extract is not intended to cover all the regulations which may apply to any particular facility, just those that are the most crucial to compliance. Should there be any questions regarding this document, call AC 317/233-7147 and ask for the x-ray machine compliance coordinator.

Rule 2. Registration of Radiation Machine Facilities and Service

Cited in: 410 IAC 5-2-1; 410 IAC 5-2-2; 410 IAC 5-2-3; 410 IAC 5-2-7; 410 IAC 5-9-1; 410 IAC 5-9-2; 410 IAC 5-9-2.5; 410 IAC 5-9-3; 410 IAC 5-10-1; 410 IAC 5-10.1-1.

410 IAC 5-2-1 Scope of rules; registration of materials

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 1. (a) 410 IAC 5-2 provides for the registration of radiation machine facilities.

(b) In addition to the requirements of 410 IAC 5-2, all registrants are subject to the applicable provisions of other sections of 410 IAC 5.

(c) In addition to 410 IAC 5-2-1(a) and 410 IAC 5-2-1(b) each person who receives, possesses, uses, transfers or acquires radioactive material shall register such materials with the board in accordance with the requirements of 410 IAC 5-2. This requirement is effective until the state enters into an effective agreement with the U.S. Nuclear Regulatory Commission for the transfer of regulatory authority under Sec. 274(b) of the Atomic Energy Act of 1954, as amended (73 Stat. 689) at which time 410 IAC 5-3, Licensing of Radioactive Material, becomes effective.

(Indiana State Department of Health; Rule HRH-2,PT B,Sec B.1; filed May 26, 1978, 3:30 pm; 1 IR 135; filed Feb 29, 1984, 10:10 am; 7 IR 839)

Cited in: 410 IAC 5-2-2.

410 IAC 5-2-2 Definitions

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 2. (a) For purposes of 410 IAC 5-2, "facility" means the location at which one or more devices or sources are installed and/or located within one building, vehicle, or under one roof and are under the same administrative control.

(b) Pursuant to 410 IAC 5-2-1(c) "radiation machine" as used throughout 410 IAC 5-2 also refers to radioactive material.

(Indiana State Department of Health; Rule HRH-2,PT B,Sec B.2; filed May 26, 1978, 3:30 pm; 1 IR 135; filed Feb 29, 1984, 10:10 am; 7 IR 840)

410 IAC 5-2-3 Exemptions

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 3. (a) Electronic equipment that produces radiation incidental to its operation for other purposes is exempt from the registration and notification requirements of 410 IAC 5-2,

providing dose equivalent rate averaged over an area of 10 square cm does not exceed 0.5 mrem per hour at 5 cm from any accessible surface of such equipment. The production, testing or factory servicing of such equipment shall not be exempt.

(b) Radiation machines while in transit or storage incident thereto are exempt from the requirements of 410 IAC 5-2.

(c) Domestic television receivers are exempt from the requirements of 410 IAC 5-2.

(Indiana State Department of Health; Rule HRH-2,PT B,Sec B.3; filed May 26, 1978, 3:30 pm; 1 IR 135; filed Feb 29, 1984, 10:10 am; 7 IR 840)

410 IAC 5-2-4 Application for registration of facility

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 4. Each person having a radiation machine facility shall:

(a) Register such facility with the board prior to the operation of a radiation machine facility. The registration shall be completed on forms furnished by the board and shall contain all the information required by the form and accompanying instructions.

(b) Designate on the application form an individual to be responsible for radiation protection.

(Indiana State Department of Health; Rule HRH-2,PT B,Sec B.4; filed May 26, 1978, 3:30 pm; 1 IR 135; filed Feb 29, 1984, 10:10 am; 7 IR 840)

410 IAC 5-2-5 Issuance of registration

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 5. (a) Upon a determination that an applicant meets the requirements of 410 IAC 5, the board shall issue a registration.

(b) The board may incorporate in the registration at the time of issuance or thereafter by appropriate rule, regulation or order, such additional requirements and conditions with respect to the registrant's receipt, possession, use and transfer of radiation machines as it deems appropriate or necessary.

(Indiana State Department of Health; Rule HRH-2,PT B,Sec B.5; filed May 26, 1978, 3:30 pm; 1 IR 135; filed Feb 29, 1984, 10:10 am; 7 IR 840)

410 IAC 5-2-6 Notice of changes

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 6. The registrant shall notify the board in writing before making any change which would render the information contained in the registration no longer accurate.

(Indiana State Department of Health; Rule HRH-2,PT B,Sec B.6; filed May 26, 1978, 3:30 pm: 1 IR 135; filed Feb 29, 1984, 10:10 am: 7 IR 841)

410 IAC 5-2-7 Advertising prohibitions

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13
Affected: IC 13-1-2

Sec. 7. No person, in any advertisement, shall refer to the fact that he or his facility is registered with the board pursuant to the provisions of 410 IAC 5-2 and no person shall state or imply that any activity under such registration has been approved by the board.

(Indiana State Department of Health; Rule HRH-2,PT B,Sec B.7; filed May 26, 1978, 3:30 pm: 1 IR 135; filed Feb 29, 1984, 10:10 am: 7 IR 841)

410 IAC 5-2-8 Dealers and assemblers; duties; notice and reports to board

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13
Affected: IC 13-1-2

Sec. 8. (a) Any person who sells, leases, transfers, lends, disposes, assembles, or installs radiation machines in this state shall notify the board within 15 days of:

(1) the name and address of persons who have received these machines;

(2) the manufacturer, model, and serial number of each radiation machine transferred; and

(3) the date of transfer of each radiation machine.

(b) In the case of diagnostic x-ray systems which contain certified components, a copy of the assembler's report prepared in compliance with requirements of the Federal Diagnostic X-Ray Standard (21 CFR 1020.30(d)) shall be submitted to the board within 15 days following completion of the assembly. Such report shall suffice in lieu of any other report by the assembler.

(c) No person shall make, sell, lease, transfer, lend, assemble, or install radiation machines or the supplies used in connection with such machines unless such supplies and equipment when properly placed in operation and used shall meet the requirements of 410 IAC 5.

(Indiana State Department of Health; Rule HRH-2,PT B,Sec B.8; filed May 26, 1978, 3:30 pm: 1 IR 135; filed Feb 29, 1984, 10:10 am: 7 IR 841)

410 IAC 5-2-9 Bringing radiation machine into state; application

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13
Affected: IC 13-1-2

Sec. 9. (a) Whenever any radiation machine is to be brought into the state, for any temporary use, the person proposing to bring such machine into the state shall give written notice to the board at least two (2) working days before such machine is to be used in the state. The notice shall include the type of radiation machine; the nature, duration, and scope of use; the exact location(s) where the radiation machine is to be used; and states in which this machine is registered. If for a specific case the two working-day period would impose an undue hardship on the person, he may, upon application to the board, obtain permission to proceed sooner.

(b) The person referred to in 410 IAC 5-2-9(a) shall:

(1) comply with all applicable requirements of the board including the certification of x-ray machine operators;

(2) supply the board with such other information as the board may reasonably request; and

(3) not operate within the state on a temporary basis in excess of 180 calendar days per year.

(Indiana State Department of Health; Rule HRH-2,PT B,Sec B.9; filed May 26, 1978, 3:30 pm: 1 IR 136; filed Feb 29, 1984, 10:10 am: 7 IR 841)

Rule 4. Protection and Exposure Standards

Cited in: 410 IAC 5-3-2; 410 IAC 5-3-6; 410 IAC 5-3-7; 410 IAC 5-3-11; 410 IAC 5-3-12.5; 410 IAC 5-3-25.2; 410 IAC 5-3-30; 410 IAC 5-3-31; 410 IAC 5-3-32; 410 IAC 5-4-1; 410 IAC 5-4-7; 410 IAC 5-4-11; 410 IAC 5-4-12; 410 IAC 5-4-21; 410 IAC 5-4-24; 410 IAC 5-5-8; 410 IAC 5-5-12; 410 IAC 5-5-13; 410 IAC 5-6-9; 410 IAC 5-7-2; 410 IAC 5-9-1; 410 IAC 5-9-2.5; 410 IAC 5-9-5; 410 IAC 5-10-2; 410 IAC 5-10-1-1; 410 IAC 5-10-1-5; 410 IAC 5-10-1-15; 410 IAC 5-10-1-16; 410 IAC 5-10-1-25.

410 IAC 5-4-1 Scope of rule

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13
Affected: IC 13-1-2

Sec. 1. (a) 410 IAC 5-4-1 establishes standards for protection against radiation hazards. Except as otherwise specifically provided, 410 IAC 5-4 applies to all licensees or registrants. It is the purpose of 410 IAC 5-4 to control the possession, use, and transfer of sources of radiation by any licensee or registrant in such a manner that the total dose to an individual does not exceed the standards of radiation protection prescribed in 410 IAC 5-4. Nothing in 410 IAC 5-4 shall be interpreted as limiting the intentional exposure of patients to radiation for the purpose of medical diagnosis or therapy.

(b) In addition to complying with the rules set forth in 410 IAC 5-4, every reasonable effort should be made to maintain radiation exposures, and releases of radioactive materials in effluents to unrestricted areas, as low as is reasonably achievable. The term "as low as is reasonably achievable" means as low as is reasonably achievable taking into account the state of technology, and the economics of improvements in relation to benefits to the public health and safety, and other societal and socio-economic considerations, and in relation to the utilization of ionizing radiation in the public interest.

(Indiana State Department of Health; Rule HRH-2,PT D,Sec D.1; filed May 26, 1978, 3:30 pm: 1 IR 174; filed Feb 29, 1984, 10:10 am: 7 IR 897)

410 IAC 5-4-2 Radiation dose to individuals in restricted areas¹

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13
Affected: IC 13-1-2

Sec. 2. (a) In accordance with the provisions of 410 IAC 5-4-3(a), and except as provided in 410 IAC 5-4-2(b), no licensee or registrant shall possess, use, receive, or transfer sources of radiation in such a manner as to cause any individual in a restricted area to receive in any period of one calendar quarter from all sources of radiation in the licensee's or registrant's

¹ For determining the doses specified in 410 IAC 5-4-2 a dose from x or gamma rays up to 10 MeV may be assumed to be equivalent to the exposure measured by a properly calibrated appropriate instrument in air at or near the body surface in the region of the highest dose rate.

possession a total occupational dose in excess of the standards specified in the following table:

Rems per Calendar Quarter

Whole body; head and trunk; active
blood-forming organs; lens of eyes; or
gonads
Hands and forearms; feet and ankles
Skin of whole body

(b) A licensee or registrant may permit an individual in a restricted area to receive a total occupational dose to the whole body greater than that permitted under 410 IAC 5-4-2(a), provided:

(1) During any calendar quarter, the total occupational dose to the whole body from sources of radiation in the licensee's or registrant's possession shall not exceed 3 rem; and

(2) The dose to the whole body, when added to the accumulated occupational dose to the whole body, shall not exceed 5(N-18) rem where "N" equals the individual's age in years at his last birthday; and

(3) The licensee or registrant has determined the individual's accumulated occupational dose to the whole body on board form "Y" or on a clear and legible record containing all the information required in that form and has otherwise complied with the requirements of 410 IAC 5-4-3. As used in 410 IAC 5-4-2(b), "dose to the whole body" shall be deemed to include any dose to the whole body, gonads, active bloodforming organs, head and trunk, or lens of eye.

(Indiana State Department of Health; Rule HRH-2, PT D, Sec D.101; filed May 26, 1978, 3:30 pm: 1 IR 174; filed Feb 29, 1984, 10:10 am: 7 IR 897)

Cited in: 410 IAC 5-3-13; 410 IAC 5-4-3; 410 IAC 5-4-4; 410 IAC 5-4-5; 410 IAC 5-4-10; 410 IAC 5-4-24; 410 IAC 5-6-3; 410 IAC 5-6-8; 410 IAC 5-6-10; 410 IAC 5-7-2; 410 IAC 5-8-4; 410 IAC 5-8-6; 410 IAC 5-9-6; 410 IAC 5-10-1-21.

410 IAC 5-4-3 Disclosure of prior exposure; certification for excess exposure (form Y)

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 3. (a)(1) Each licensee or registrant shall require any individual, prior to first entry of the individual into the licensee's or registrant's restricted area during each employment or work assignment under such circumstances that the individual will receive or is likely to receive in any period of 1 calendar quarter an occupational dose in excess of 25 percent of the applicable standards specified in 410 IAC 5-4-2(a) and 410 IAC 5-4-5(a), to disclose in a written, signed statement, either:

(i) That the individual had no prior occupational dose during the current calendar quarter, or

(ii) The nature and amount of any occupational dose which the individual may have received during the specifically identified current calendar quarter, from sources of radiation possessed or controlled by other persons.

(2) Each licensee or registrant shall maintain records of such statements until the board authorizes disposition.

(b) Before permitting, pursuant to 410 IAC 5-4-2(b), any individual in a restricted area to receive an occupational

radiation dose in excess of the standards specified in 410 IAC 5-4-2(a), each licensee or registrant shall:

(1) obtain a certificate on board form "Y" or on a clear and legible record containing all the information required in that form, signed by the individual, showing each period of time after the individual attained the age of 18 in which the individual received an occupational dose of radiation; and

(2) calculate on board form "Y" in accordance with the instructions appearing therein, or on a clear and legible record containing all the information required in that form, the previously accumulated occupational dose received by the individual and the additional dose allowed for that individual under 410 IAC 5-4-2(b).

(c)(1) In the preparation of board form "Y," or a clear and legible record containing all the information required in that form, the licensee or registrant shall make a reasonable effort to obtain reports of the individual's previously accumulated occupational dose. For each period for which the licensee or registrant obtains such reports, he shall use the dose shown in the report in preparing the form. In any case where a licensee or registrant is unable to obtain reports of the individual's occupational dose for a previous complete calendar quarter, it shall be assumed that the individual has received the occupational dose specified in whichever of the following columns that apply:

Part of Body	Column 1	Column 2
	Assumed Dose in Rems for Calendar Quarters Prior to January 1, 1961	Assumed Dose in Rems for Calendar Quarters Beginning on or After January 1, 1961
Whole body, gonads, active blood-forming organs, head and trunk, lens of eye	3¾	1¼

(2) The licensee or registrant shall retain and preserve records used in preparing board form "Y" until the board authorizes their disposition. If calculation of the individual's accumulated occupational dose for all periods prior to January 1, 1961, yields a result higher than the applicable accumulated dose value for the individual as of that date, as specified in 410 IAC 5-4-2(b)(2), the excess may be disregarded.

(Indiana State Department of Health; Rule HRH-2, PT D, Sec D.102; filed May 26, 1978, 3:30 pm: 1 IR 175; filed Feb 29, 1984, 10:10 am: 7 IR 897)
Cited in: 410 IAC 5-4-2; 410 IAC 5-6-3.

410 IAC 5-4-5 Exposure of minors²

² For determining the doses specified in 410 IAC 5-4-5, a dose from x or gamma radiation up to 10 MeV may be assumed to be equivalent to the

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13
Affected: IC 13-1-2

Sec. 5. (a) No licensee or registrant shall possess, use, or transfer sources of radiation in such a manner as to cause any individual within a restricted area, who is under 18 years of age, to receive in any period of 1 calendar quarter from all sources of radiation in such licensee's or registrant's possession a dose in excess of 10 percent of the standards specified in the table in 410 IAC 5-4-2(a).

(b) No licensee or registrant shall possess, use, or transfer radioactive material in such a manner as to cause any individual within a restricted area, who is under 18 years of age to be exposed to airborne radioactive material in an average concentration in excess of the limits specified in Appendix A, 410 IAC 5-4-27, Table II. For purposes of this paragraph, concentrations may be averaged over periods not greater than a week.

(c) The provisions of 410 IAC 5-4-4(b)(2) and 410 IAC 5-4-4(c) shall apply to exposures subject to 410 IAC 5-4-5(b) except that the references in 410 IAC 5-4-4(b)(2) and 410 IAC 5-4-4(c) to Appendix A, 410 IAC 5-4-27, Table I, Column 1 shall be deemed to be references to Appendix A, 410 IAC 5-4-27, Table II, Column 1.

(Indiana State Department of Health; Rule HRH-2,PT D,Sec D.104; filed May 26, 1978, 3:30 pm: 1 IR 177; filed Feb 29, 1984, 10:10 am: 7 IR 900)
Cited in: 410 IAC 5-4-3; 410 IAC 5-4-24; 410 IAC 5-6-10.

410 IAC 5-4-6 Permissible levels of radiation from external sources in unrestricted areas³

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13
Affected: IC 13-1-2

Sec. 6. (a) Except as authorized by the board pursuant to 410 IAC 5-4-6(b) no licensee or registrant shall possess, use, or transfer sources of radiation in such a manner as to create in any unrestricted area from such sources of radiation in his possession:

(1) Radiation levels which, if an individual were continuously present in the area, could result in his receiving a dose in excess of 2 millirems in any 1 hour; or

(2) Radiation levels which, if an individual were continuously present in the area could result in his receiving a dose in excess of 100 millirems in any 7 consecutive days.

(b) Any person may apply to the board for proposed limits upon levels of radiation in unrestricted areas in excess of those specified in 410 IAC 5-4-6(a) resulting from the applicant's possession or use of sources of radiation. Such applications should include information as to anticipated average radiation

exposure measured by a properly calibrated appropriate instrument in air at or near the body surface in the region of the highest dose rate.

³ It is the intent of 410 IAC 5-4-6 to limit radiation levels so that it is unlikely that individuals in unrestricted areas would receive a dose to the whole body in excess of 0.5 rem in any one year. If in specific instances, it is determined by the board that this intent is not met, the board may, pursuant to 410 IAC 5-1-7, impose such additional requirements on the licensee or registrant as may be necessary to meet the intent.

levels and anticipated occupancy times for each unrestricted area involved. The board will approve the proposed limits if the applicant demonstrates to the satisfaction of the board that the proposed limits are not likely to cause any individual to receive a dose to the whole body in any period of 1 calendar year in excess of 0.5 rem.

(Indiana State Department of Health; Rule HRH-2,PT D,Sec D.105; filed May 26, 1978, 3:30 pm: 1 IR 177; filed Feb 29, 1984, 10:10 am: 7 IR 900)
Cited in: 410 IAC 5-5-3; 410 IAC 5-5-3.2; 410 IAC 5-6-10; 410 IAC 5-8-4; 410 IAC 5-9-6; 410 IAC 5-10.1-21.

410 IAC 5-4-9 Surveys

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13
Affected: IC 13-1-2

Sec. 9. Each licensee or registrant shall make or cause to be made such surveys as may be necessary for him to establish compliance with 410 IAC 5.

(Indiana State Department of Health; Rule HRH-2,PT D,Sec D.201; filed May 26, 1978, 3:30 pm: 1 IR 178; filed Feb 29, 1984, 10:10 am: 7 IR 902)
Cited in: 410 IAC 5-4-21; 410 IAC 5-5-7; 410 IAC 5-8-4; 410 IAC 5-10.1-8.

410 IAC 5-4-10 Personnel monitoring requirements⁴

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13
Affected: IC 13-1-2

Sec. 10. Each licensee or registrant shall supply appropriate personnel monitoring equipment to, and shall require the use of such equipment by:

(a) Each individual who enters a restricted area under such circumstances that he receives, or is likely to receive, a dose in any calendar quarter in excess of 25 percent of the applicable value specified in 410 IAC 5-4-2(a);

(b) Each individual under 18 years of age who enters a restricted area under such circumstances that he receives, or is likely to receive, a dose in any calendar quarter in excess of 5 percent of the applicable value specified in 410 IAC 5-4-2(a);

(c) Each individual who enters a high radiation area.

(Indiana State Department of Health; Rule HRH-2,PT D,Sec D.202; filed May 26, 1978, 3:30 pm: 1 IR 178; filed Feb 29, 1984, 10:10 am: 7 IR 902)
Cited in: 410 IAC 5-4-21; 410 IAC 5-6-3.

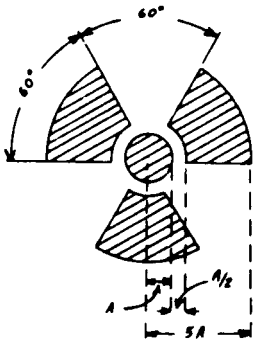
410 IAC 5-4-11 Caution signs and labels; alarm signals

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13
Affected: IC 13-1-2

Sec. 11. (a) General.

(1) Except as otherwise authorized by the board, symbols prescribed by 410 IAC 5-4-11 shall use the conventional radiation caution colors (magenta or purple on yellow background). The symbol prescribed by this section is the conventional three-blade design:

⁴ After July 1, 1984, all required personnel monitoring equipment must be obtained from personnel dosimetry processors having an accreditation program approved by the National Voluntary Laboratory Accreditation Program (NVLAP) of the National Bureau of Standards.

**RADIATION SYMBOL**

(A) Cross-hatch area is to be magenta or purple.

(B) Background is to be yellow.

(2) In addition to the contents of signs and labels prescribed in this section, a licensee or registrant may provide on or near such signs and labels any additional information which may be appropriate in aiding individuals to minimize exposure to radiation.

(b) Radiation Areas. Each radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION⁵

RADIATION AREA

(c) High Radiation Areas.

(1) Each high radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION⁶

HIGH RADIATION AREA

(2) Each entrance or access point to a high radiation area shall be:

(i) Equipped with a control device which shall cause the level of radiation to be reduced below that at which an individual might receive a dose of 100 millirems in 1 hour upon entry into the area; or

(ii) Equipped with a control device which shall energize a conspicuous visible or audible alarm signal in such a manner that the individual entering the high radiation area and the licensee or a supervisor of the activity are made aware of the entry; or

(iii) Maintained locked except during periods when access to the area is required, with positive control over each individual entry.

(3) The controls required by 410 IAC 5-4-11(c)(2) shall be established in such a way that no individual will be prevented from leaving a high radiation area.

(4) In the case of a high radiation area established for a period of 30 days or less, direct surveillance to prevent unauthorized entry may be substituted for the controls required by 410 IAC 5-4-11(c)(2).

⁵ Or "Danger."

⁶ Or "Danger."

(5) Any licensee or registrant may apply to the board for approval of methods not included in 410 IAC 5-4-11(c)(2) and (4) for controlling access to high radiation areas. The board will approve the proposed alternatives if the licensee or registrant demonstrates that the alternative methods of control will prevent unauthorized entry into a high radiation area, and that the requirement of 410 IAC 5-4-11(c)(3) is met.

(6) Each area in which there may exist radiation levels in excess of 500 rems in 1 hour at 1 meter from a sealed radioactive source that is used to irradiate materials shall have entry control devices and alarms meeting the criteria specified in Section 20.203(c)(6) of 10 CFR Part 20.

(7) The requirements of 410 IAC 5-4-11(c)(6) shall not apply to radioactive sources that are used in teletherapy, industrial radiography, or in completely self-contained irradiators. In the case of open field irradiators in which certain of the criteria specified in 410 IAC 5-4-11(c)(6) are impracticable, equivalent protection shall be provided by license conditions.

(d) Airborne Radioactivity Areas. Each airborne radioactivity area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION⁷

AIRBORNE RADIOACTIVITY AREA

(e) Additional Requirements.

(1) Each area or room in which any radioactive material, other than natural uranium or thorium, is used or stored in an amount exceeding 10 times the quantity of radioactive material specified in Appendix B, 410 IAC 5-4-28, shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION⁸

RADIOACTIVE MATERIAL

(2) Each area or room in which natural uranium or thorium is used or stored in an amount exceeding 100 times the quantity specified in Appendix B, 410 IAC 5-4-28, shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION⁹

RADIOACTIVE MATERIAL

(f) Containers.

(1) Except as provided in 410 IAC 5-4-11(f)(3) each container of radioactive material shall bear a durable, clearly visible label identifying the radioactive contents.

(2) A label required pursuant to 410 IAC 5-4-11(f)(1) shall bear the radiation caution symbol and the words:

CAUTION¹⁰

RADIOACTIVE MATERIAL

It shall also provide sufficient information¹¹ to permit individuals handling or using the containers, or working in the

⁷ Or "Danger."

⁸ Or "Danger."

⁹ Or "Danger."

¹⁰ Or "Danger."

¹¹ As appropriate, the information will include radiation levels, kinds of material, estimate of activity, date for which activity is estimated, etc.

vicinity thereof, to take precautions to avoid or minimize exposures.

(3) Notwithstanding the provisions of 410 IAC 5-4-11(f)(1) labeling is not required:

(i) For containers that do not contain radioactive material in quantities greater than the applicable quantities listed in Appendix B, 410 IAC 5-4-28;

(ii) For containers containing only natural uranium or thorium in quantities no greater than 10 times the applicable quantities listed in Appendix B, 410 IAC 5-4-28;

(iii) For containers that do not contain radioactive material in concentrations greater than the applicable concentrations listed in Appendix A, 410 IAC 5-4-27, Table I, Column 2;

(iv) For containers when they are attended by an individual who takes the precautions necessary to prevent the exposure of any individual to radiation or radioactive material in excess of the limits established by 410 IAC 5-4;

(v) For containers when they are in transport and packaged and labeled in accordance with regulations published by the U.S. Department of Transportation;

(vi) For containers which are accessible only to individuals authorized to handle or use them¹² or to work in the vicinity thereof, provided that the contents are identified to such individuals by a readily available written record; and

(vii) For manufacturing and process equipment such as piping and tanks.

(4) Each licensee or registrant shall, prior to disposal of an empty uncontaminated container to unrestricted areas, remove or deface the radioactive material label or otherwise clearly indicate that the container no longer contains radioactive material.

(g) All radiation machines shall be labeled in a manner which cautions individuals that radiation is produced when the machine is being operated.

(Indiana State Department of Health; Rule HRH-2,PT D,Sec D.203; filed May 26, 1978, 3:30 pm: 1 IR 178; filed Feb 29, 1984, 10:10 am: 7 IR 903)
Cited in: 410 IAC 5-3-13; 410 IAC 5-4-12; 410 IAC 5-4-28; 410 IAC 5-5-11.5; 410 IAC 5-5-15; 410 IAC 5-5-16; 410 IAC 5-7-2; 410 IAC 5-8-3; 410 IAC 5-8-4; 410 IAC 5-9-8.

410 IAC 5-4-12 Exceptions to posting requirements

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 12. Notwithstanding the provisions of 410 IAC 5-4-11:

(a) A room or area is not required to be posted with a caution sign because of the presence of a sealed source, provided the radiation level 12 inches from the surface of the source container or housing does not exceed 5 millirem per hour.

(b) Rooms or other areas in hospitals are not required to be posted with caution signs, and control of entrance or access thereto pursuant to 410 IAC 5-4-11(c) is not required, because of the presence of patients containing radioactive material provided that there are personnel in attendance who will take the precautions necessary to prevent the exposure of any individual

¹² For example, containers in locations such as water-filled canals, storage vaults, or hot cells.

to radiation or radioactive material in excess of the limits established in 410 IAC 5-4.

(c) Caution signs are not required to be posted in areas or rooms containing radioactive material for periods of less than 8 hours provided that (1) the material is constantly attended during such periods by an individual who shall take the precautions necessary to prevent the exposure of any individual to radiation or radioactive material in excess of the limits established in 410 IAC 5-4, and (2) such area or room is subject to the licensee's or registrant's control.

(d) A room or other area is not required to be posted with a caution sign, and control is not required for each entrance or access point to a room or other area which is a high radiation area solely because of the presence of radioactive material prepared for transport and packaged and labeled in accordance with regulations of the U.S. Department of Transportation.

(Indiana State Department of Health; Rule HRH-2,PT D,Sec D.204; filed May 26, 1978, 3:30 pm: 1 IR 180; filed Feb 29, 1984, 10:10 am: 7 IR 904)
Cited in: 410 IAC 5-5-16; 410 IAC 5-7-2.

410 IAC 5-4-13 Instruction of personnel

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 13. Instructions required for individuals working in or frequenting any portion of a restricted area are specified in 410 IAC 5-10-3.

(Indiana State Department of Health; Rule HRH-2,PT D,Sec D.205; filed May 26, 1978, 3:30 pm: 1 IR 180; filed Feb 29, 1984, 10:10 am: 7 IR 905)

410 IAC 5-4-14 Storage of radiation sources

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 14. (a) Sources of radiation shall be secured against unauthorized removal from the place of storage.

(b) Sources of radiation in an unrestricted area and not in storage shall be tended under the constant surveillance and immediate control of the licensee or registrant.

(Indiana State Department of Health; Rule HRH-2,PT D,Sec D.206; filed May 26, 1978, 3:30 pm: 1 IR 180; filed Feb 29, 1984, 10:10 am: 7 IR 905)

410 IAC 5-4-21 Recordkeeping requirements

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 21. (a) Each licensee or registrant shall maintain records showing the radiation exposures of all individuals for whom personnel monitoring is required under 410 IAC 5-4-10. Such records shall be kept on board form "Z", in accordance with the instructions contained in that form, or on clear and legible records containing all the information required by board form "Z". The doses entered on the forms or records shall be for periods of time not exceeding 1 calendar quarter.

(b) Each licensee or registrant shall maintain records in the same units used in 410 IAC 5-4, showing the results of surveys required by 410 IAC 5-4-9, monitoring required by 410 IAC 5-4-15(b) and (c), and disposals made under 410 IAC 5-4-17, 410 IAC 5-4-18, and 410 IAC 5-4-19.

(c)(1) Records of individual exposure to radiation and to radioactive material which must be maintained pursuant to the provisions of 410 IAC 5-4-21(a) and records of bioassays, including results of whole body counting examinations, made pursuant to 410 IAC 5-4-8 shall be preserved until the board authorizes their disposition.

(2) Records of the results of surveys and monitoring which must be maintained pursuant to 410 IAC 5-4-21(b) shall be preserved for 2 years after the completion of the survey except that the following records shall be maintained until the board authorizes their disposition:

(i) records of the results of surveys to determine compliance with 410 IAC 5-4-4(a);

(ii) in the absence of personnel monitoring data, records of the results of surveys to determine external radiation dose; and

(iii) records of the results of surveys used to evaluate the release of radioactive effluents to the environment.

(3) Records of disposal of licensed material made pursuant to 410 IAC 5-4-17, 410 IAC 5-4-18 or 410 IAC 5-4-19 shall be maintained until the board authorizes their disposition.

(4) Records which must be maintained pursuant to 410 IAC 5-4-21 may be the original or a reproduced copy or microform if such reproduced copy or microform is duly authenticated by authorized personnel and the microform is capable of producing a clear and legible copy after storage for the period specified by board rules.

(5) If there is a conflict between the board's rules in 410 IAC 5-4-21, license condition, or other written board approval or authorization pertaining to the retention period for the same type of record, the retention period specified in the rules in 410 IAC 5-4-21 for such records shall apply unless the board, pursuant to 410 IAC 5-1-3(a), has granted a specific exemption from the record retention requirements specified in 410 IAC 5-4-21.

(d) The discontinuance of, or curtailment of, activities does not relieve the licensee or registrant of responsibility for retaining all records required by 410 IAC 5-4-21. A licensee or registrant may, however, request the board to accept such records. The acceptance of the records by the board relieves the licensee or registrant of subsequent responsibility only in respect to their preservation as required by 410 IAC 5-4-21.

(Indiana State Department of Health; Rule HRH-2,PT D,Sec D.401; filed May 26, 1978, 3:30 pm; 1 IR 182; filed Feb 29, 1984, 10:10 am; 7 IR 908)
Cited in: 410 IAC 5-10-4.

410 IAC 5-4-22 Theft or loss of sources; reporting

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 22. Each licensee or registrant shall report by telephone or mailgram to the board the theft or loss of any source of radiation immediately after such occurrence becomes known.

(Indiana State Department of Health; Rule HRH-2,PT D,Sec D.402; filed May 26, 1978, 3:30 pm; 1 IR 182; filed Feb 29, 1984, 10:10 am; 7 IR 908)
Cited in: 410 IAC 5-3-7; 410 IAC 5-3-31.

410 IAC 5-4-23 Incident reports

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 23. (a) Immediate Notification. Each licensee or registrant shall immediately notify the board by telephone and telegraph of any incident involving any source of radiation possessed by him and which may have caused or threatens to cause:

(1) a dose to the whole body of any individual of 25 rems or more of radiation; a dose to the skin of the whole body of any individual of 150 rems or more of radiation; or a dose to the feet, ankles, hands, or forearms of any individual of 375 rems or more of radiation; or

(2) the release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed 5,000 times the limits specified for such materials in Appendix A, 410 IAC 5-4-27, Table II; or

(3) a loss of 1 working week or more of the operation of any facilities affected; or

(4) damage to property in excess of \$200,000.

(b) Twenty-four Hour Notification. Each licensee or registrant shall within 24 hours notify the board by telephone or mailgram of any incident involving any source of radiation possessed by him and which may have caused or threatens to cause:

(1) A dose to the whole body of any individual of 5 rems or more of radiation; a dose to the skin of the whole body of any individual of 30 rems or more of radiation; or a dose to the feet, ankles, hands, or forearms of 75 rems or more of radiation; or

(2) The release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed 500 times the limits specified for such materials in Appendix A, 410 IAC 5-4-27, Table II; or

(3) A loss of 1 day or more of the operation of any facilities affected; or

(4) Damage to property in excess of \$2,000.

(c) Any report filed with the board pursuant to 410 IAC 5-4-23 shall be prepared in such a manner that names of individuals who have received excessive doses will be stated in a separate part of the report.

(Indiana State Department of Health; Rule HRH-2,PT D,Sec D.403; filed May 26, 1978, 3:30 pm; 1 IR 182; filed Feb 29, 1984, 10:10 am; 7 IR 909)
Cited in: 410 IAC 5-3-7; 410 IAC 5-3-31; 410 IAC 5-4-24.

410 IAC 5-4-24 Overexposure reports

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 24. (a) In addition to any notification required by 410 IAC 5-4-23, each licensee or registrant shall make a report in writing within 30 days to the board of:

(1) each exposure of an individual to radiation in excess of the applicable standards in 410 IAC 5-4-2 or 410 IAC 5-4-5(a) or the license;

(2) each exposure of an individual to radioactive material in excess of the applicable limits in 410 IAC 5-4-4(a)(1), 410 IAC 5-4-4(a)(2), 410 IAC 5-4-5(b) or the license;

(3) levels of radiation or concentrations of radioactive material in a restricted area in excess of any other applicable limit in the license;

(4) any incident for which notification is required by 410 IAC 5-4-23; and

(5) levels of radiation or concentrations of radioactive material, whether or not involving excessive exposure of any individual, in an unrestricted area in excess of 10 times any applicable limit set forth in this part [410 IAC 5-4] or in the license.

(b) Each report required under 410 IAC 5-4-24 shall describe the extent of exposure of individuals to radiation or to radioactive material, including estimates of each individual's exposure as required by 410 IAC 5-4-24; levels of radiation and concentrations of radioactive material involved; the cause of the exposure, levels or concentrations; and corrective steps taken or planned to assure against a recurrence.

(c) Any report filed with the board pursuant to 410 IAC 5-4-24 shall include for each individual exposed the name, social security number, and the date of birth, and an estimate of the individual's dose. The report shall be prepared so that this information is stated in a separate part of the report.

(Indiana State Department of Health; Rule HRH-2, PT D, Sec D.405; filed May 26, 1978, 3:30 pm; 1 IR 183; filed Feb 29, 1984, 10:10 am; 7 IR 909)
Cited in: 410 IAC 5-4-26; 410 IAC 5-10-4.

410 IAC 5-4-26 Notice and report to exposed individuals

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 26. (a) Requirements for notification and reports to individuals of exposure to radiation or radioactive material are specified in 410 IAC 5-10-4.

(b) When a licensee or registrant is required pursuant to 410 IAC 5-4-24 to report to the board any exposure of an individual to radiation or radioactive material, the licensee or registrant shall also notify the individual. Such notice shall be transmitted at a time not later than the transmittal to the board, and shall comply with the provisions of 410 IAC 5-10-4(a).

(Indiana State Department of Health; Rule HRH-2, PT H, Sec D.408; filed May 26, 1978, 3:30 pm; 1 IR 183; filed Feb 29, 1984, 10:10 am; 7 IR 910)

Rule 8. Radiation Safety Requirements for Analytical X-Ray Equipment

Cited in: 410 IAC 5-8-1; 410 IAC 5-8-2.

410 IAC 5-8-1 Scope of rule

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 1. 410 IAC 5-8 provides special requirements for analytical x-ray equipment. The requirements of 410 IAC 5-8 are in addition to, and not in substitution for, applicable requirements in other parts of 410 IAC 5.

(Indiana State Department of Health; Rule HRH-2, PT H, Sec H.1; filed May 26, 1978, 3:30 pm; 1 IR 222; filed Feb 29, 1984, 10:10 am; 7 IR 969)

410 IAC 5-8-2 Definitions

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 2. As used in 410 IAC 5-8, the following definitions apply:

"Analytical x-ray equipment" means equipment used for x-ray diffraction or fluorescence analysis.

"Analytical x-ray system" means a group of components utilizing x-rays to determine the elemental composition or to examine the microstructure of materials.

"Fail-safe characteristics" mean a design feature which causes beam port shutters to close, or otherwise prevents emergence of the primary beam, upon the failure of a safety or warning device.

"Local components" mean part of an analytical x-ray system and include areas that are struck by x-rays such as radiation source housings, port and shutter assemblies, collimators, sample holders, cameras, goniometers, detectors and shielding, but do not include power supplies, transformers, amplifiers, readout devices, and control panels.

"Normal operating procedures" mean step-by-step instructions necessary to accomplish the analysis. These procedures shall include sample insertion and manipulation, equipment alignment, routine maintenance by the registrant, and data-recording procedures which are related to radiation safety.

"Open-beam configuration" means an analytical x-ray system in which an individual could accidentally place some part of his body in the primary beam path during normal operation.

"Primary beam" means radiation which passes through an aperture of the source housing by a direct path from the x-ray tube or a radioactive source located in the radiation source housing.

(Indiana State Department of Health; Rule HRH-2, PT H, Sec H.2; filed May 26, 1978, 3:30 pm; 1 IR 223; filed Feb 29, 1984, 10:10 am; 7 IR 970)

410 IAC 5-8-3 Equipment requirements

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 3. (a) Safety Device. A device which prevents the entry of any portion of an individual's body into the primary x-ray beam path or which causes the beam to be shut off upon entry into its path shall be provided on all open-beam configurations. A registrant (or licensee) may apply to the board for an exemption from the requirement of a safety device. Such application shall include:

(1) A description of the various safety devices that have been evaluated;

(2) The reason each of these devices cannot be used; and

(3) A description of the alternative methods that will be employed to minimize the possibility of an accidental exposure, including procedures to assure that operators and others in the area will be informed of the absence of safety devices.

(b) Warning Devices.

(1) Open-beam configurations shall be provided with a readily discernible indication of:

(i) X-ray tube status (ON-OFF) located near the radiation source housing, if the primary beam is controlled in this manner; and/or

(ii) Shutter status (OPEN-CLOSED) located near each port on the radiation source housing, if the primary beam is controlled in this manner.

(2) Warning devices shall be labeled so that their purpose is easily identified. On equipment installed after June 25, 1978, warning devices shall have fail-safe characteristics.

(c) Ports. Unused ports on radiation source housings shall be secured in the closed position in a manner which will prevent casual opening.

(d) Labeling. All analytical x-ray equipment shall be labeled with a readily discernible sign or signs bearing the radiation symbol and the words:

(1) "CAUTION)HIGH INTENSITY X-RAY BEAM," or words having a similar intent, on the x-ray source housing; and

(2) "CAUTION RADIATION)THIS EQUIPMENT PRODUCES RADIATION WHEN ENERGIZED," or words having a similar intent, near any switch that energizes an x-ray tube if the radiation source is an x-ray tube; or

(3) "CAUTION)RADIOACTIVE MATERIAL," or words having a similar intent, on the source housing in accordance with 410 IAC 5-4-11 if the radiation source is a radionuclide.

(e) Shutters. On open-beam configurations installed after June 25, 1978, each port on the radiation source housing shall be equipped with a shutter that cannot be opened unless a collimator or a coupling has been connected to the port.

(f) Warning Lights. An easily visible warning light labeled with the words "X-RAY, ON," or words having a similar intent, shall be located:

(1) Near any switch that energizes an x-ray tube and shall be illuminated only when the tube is energized; or

(2) In the case of a radioactive source, near any switch that opens a housing shutter, and shall be illuminated only when the shutter is open.

(3) On equipment installed after June 25, 1978, warning lights shall have fail-safe characteristics.

(g) Radiation Source Housing. Each radiation source housing shall be subject to the following requirements:

(1) Each x-ray tube housing shall be equipped with an interlock that shuts off the tube if it is removed from the radiation source housing or if the housing is disassembled.

(2) Each radioactive source housing or port cover or each x-ray tube housing shall be so constructed that, with all shutters closed, the radiation measured at a distance of 5 cm from its surface is not capable of producing a dose in excess of 2.5 millirems in one hour. For systems utilizing x-ray tubes, this limit shall be met at any specified tube rating.

(3) If radioactive sources are used, corresponding dose limits shall not exceed 2 mrem per hour.

(h) Generator Cabinet. Each x-ray generator shall be supplied with a protective cabinet which limits leakage radiation measured at a distance of 5 cm from its surface such that it is not capable of producing a dose in excess of 0.25 mrem in one hour.

(Indiana State Department of Health; Rule HRH-2, PT H, Sec H.3; filed May 26, 1978, 3:30 pm; 1 IR 223; filed Feb 29, 1984, 10:10 am; 7 IR 970)

410 IAC 5-8-4 Area requirements; surveys; posting

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 4. (a) Radiation Levels. The local components of an analytical x-ray system shall be located and arranged and shall include sufficient shielding or access control such that no radiation levels exist in any area surrounding the local component group which could result in a dose to an individual present therein in excess of the dose limits given in 410 IAC 5-4-6. For systems utilizing x-ray tubes, these levels shall be met at any specified tube rating.

(b) Surveys

(1) Radiation surveys, as required by 410 IAC 5-4-9, of all analytical x-ray systems sufficient to show compliance with paragraph 410 IAC 5-8-4(a) shall be performed:

(i) Upon installation of the equipment, and at least once every 12 months thereafter;

(ii) Following any change in the initial arrangement, number or type of local components in the system;

(iii) Following any maintenance requiring the disassembly or removal of a local component in the system;

(iv) During the performance of maintenance and alignment procedures if the procedures require the presence of a primary x-ray beam when any local component in the system is disassembled or removed;

(v) Any time a visual inspection of the local components in the system reveals an abnormal condition; and

(vi) Whenever personnel monitoring devices show a significant increase over the previous monitoring period or the readings are approaching the limits specified in 410 IAC 5-4-2.

(2) Radiation survey measurements shall not be required if a registrant (or licensee) can demonstrate compliance to the satisfaction of the board with 410 IAC 5-8-4 in some other manner.

(c) Posting. Each area or room containing analytical x-ray equipment shall be conspicuously posted with a sign or signs bearing the radiation symbol and the words "CAUTION)X-RAY EQUIPMENT," or words having a similar intent in accordance with 410 IAC 5-4-11.

(Indiana State Department of Health; Rule HRH-2, PT H, Sec H.4; filed May 26, 1978, 3:30 pm; 1 IR 224; filed Feb 29, 1984, 10:10 am; 7 IR 971)

410 IAC 5-8-5 Operation requirements

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 5. (a) Procedures. Normal operating procedures shall be written and available to all analytical x-ray equipment workers. No person shall be permitted to operate analytical x-ray equipment in any manner other than that specified in the procedures unless such person has obtained written approval of the radiation safety officer.

(b) Bypassing. No person shall bypass a safety device unless such person has obtained the approval of the radiation safety officer. Such approval shall be for a specified period of time. When a safety device has been bypassed, a readily discernible sign bearing the words "SAFETY DEVICE NOT WORKING,"

or words having a similar intent, shall be placed on the radiation source housing.

(c) Repair or Modification of X-Ray Tube Systems. Except as specified in 410 IAC 5-8-5(b), no operation involving removal of covers, shielding materials or tube housings or modifications to shutters, collimators, or beam stops shall be performed without ascertaining that the tube is off and will remain off until safe conditions have been restored. The main switch, rather than interlocks, shall be used for routine shutdown in preparation for repairs.

(d) Radioactive Source Replacement, Testing or Repair. Radioactive source housings shall be opened for source replacement, leak testing or other maintenance or repair procedures only by individuals authorized to specifically conduct such procedures under a license issued by the U.S. Nuclear Regulatory Commission, an agreement state or a licensing state.

(Indiana State Department of Health; Rule HRH-2, PT H, Sec H.5; filed May 26, 1978, 3:30 pm: 1 IR 224; filed Feb 29, 1984, 10:10 am: 7 IR 971)

410 IAC 5-8-6 Personnel requirements; instruction; monitoring

Authority: IC 13-1-2-9; IC 13-1-2-11; IC 16-1-3-13

Affected: IC 13-1-2

Sec. 6. (a) Instruction. No person shall be permitted to operate or maintain analytical x-ray equipment unless such person has received instruction in and demonstrated competence as to:

(1) Identification of radiation hazards associated with the use of the equipment;

(2) Significance of the various radiation warning, safety devices, and interlocks incorporated into the equipment, or the reasons they have not been installed on certain pieces of equipment and the extra precautions required in such cases;

(3) Proper operating procedures for the equipment;

(4) Recognition of symptoms of an acute localized exposure; and

(5) Proper procedures for reporting an actual or suspected exposure.

(b) Personnel Monitoring.

(1) Finger or wrist dosimetric devices shall be provided to and shall be used by:

(i) Analytical x-ray equipment workers using systems having an open-beam configuration and not equipped with a safety device; and

(ii) Personnel maintaining analytical x-ray equipment if the maintenance procedures require the presence of a primary x-ray beam when any local component in the analytical x-ray system is disassembled or removed.

(2) Reported dose values shall not be used for the purpose of determining compliance with 410 IAC 5-4-2 unless evaluated by a qualified radiation health physicist.

(Indiana State Department of Health; Rule HRH-2, PT H, Sec H.6; filed May 26, 1978, 3:30 pm: 1 IR 224; filed Feb 29, 1984, 10:10 am: 7 IR 972)